

WHAT IS CLAIMED IS:

1. A printhead comprising:
a body, portions of the body defining a fluid chamber and a nozzle orifice, the nozzle orifice being in fluid communication with the fluid chamber;
a drop forming mechanism operatively associated with the nozzle orifice of the body; and
a plate removably positioned over the body, the plate having at least one orifice, the at least one orifice being in fluid communication with the nozzle orifice of the body.
2. The printhead according to Claim 1, the nozzle orifice of the body having a diameter, wherein the at least one orifice of the plate has a diameter, the diameter of the at least one orifice of the plate being less than the diameter of the nozzle orifice of the body.
3. The printhead according to Claim 1, the nozzle orifice of the body having a diameter, wherein the at least one orifice of the plate includes a plurality of orifices, each having an individual diameter, the individual diameters of the plurality of orifices of the plate being less than the diameter of the nozzle orifice of the body.
4. The printhead according to Claim 1, the body having a surface facing the plate, the plate having a surface facing the body, the surfaces being in contact with each other.
5. The printhead according to Claim 4, wherein the surfaces are maintained in contact with each other with an external clamping mechanism.
6. The printhead according to Claim 5, wherein the external clamping mechanism is a sheet clamp.

7. The printhead according to Claim 5, wherein the external clamping mechanism is a wire clamp.

8. The printhead according to Claim 5, the plate including a flexible portion, wherein the external clamping mechanism includes the flexible portion of the plate positioned around the body.

9. The printhead according to Claim 5, wherein the external clamping mechanism is an electrostatic clamping mechanism.

10. The printhead according to Claim 5, wherein the external clamping mechanism is a magnetic clamping mechanism.

11. The printhead according to Claim 10, wherein the external clamping mechanism includes an electromagnet.

12. The printhead according to Claim 5, wherein the external clamping mechanism includes a vacuum.

13. The printhead according to Claim 5, wherein each surface is chemically treated so as to allow surfaces to separate when the clamping mechanism is removed.

14. The printhead according to Claim 13, wherein the chemical treatment renders each surface hydrophobic.

15. The printhead according to Claim 4, wherein the positions of the surfaces of the plate and the body are maintained relative to each other with a liquid.

16. The printhead according to Claim 4, wherein the positions of the surfaces of the plate and the body are maintained relative to each other with a material having a melting point less than 100°C.

17. The printhead according to Claim 4, wherein the positions of the surfaces of the plate and the body are maintained relative to each other with a material which can be removed from the body with a peeling force less than 100 grams/square centimeter.

18. The printhead according to Claim 4, wherein the surfaces are maintained in contact with each other with a force adjustable clamping mechanism such that the at least one orifice is positionable relative to the nozzle orifice of the body.

19. The printhead according to Claim 1, wherein the plate is elastic such that the at least one orifice of the plate is positionable within the nozzle orifice of the body.

20. The printhead according to Claim 1, wherein the plate is elastic.

21. The printhead according to Claim 1 wherein the shape of the at least one orifice of the plate is substantially round.

22. The printhead according to Claim 1 wherein the shape of the at least one orifice of the plate is other than round.

23. The printhead according to Claim 1, the plate having a thickness, the at least one nozzle orifice of the plate having a diameter, wherein a ratio of the thickness of the plate to the diameter of the at least nozzle orifice of the plate is less than 0.20.

24. The printhead according to Claim 1, the body having a thickness, the at least one nozzle orifice of the plate having a diameter, wherein a ratio of the thickness of the body to the diameter of the at least one nozzle orifice of the plate is less than 0.20.

25. The printhead according to Claim 1, wherein the drop forming mechanism includes a piezoelectric actuator.

26. The printhead according to Claim 1, wherein the drop forming mechanism includes a heater.

27. The printhead according to Claim 26, wherein the heater is a ring surrounding the nozzle orifice.

28. The printhead according to Claim 27, the at least one nozzle orifice of the plate having a center, wherein the heater ring is located no more than 200 microns from the center of the at least one nozzle orifice of the plate.

29. The printhead according to Claim 26, further comprising a heat conducting element positioned between the body and the plate, the heat conducting element being operatively associated with the heater.

30. The printhead according to Claim 29, wherein the heat conducting element is a ring surrounding the at least one nozzle orifice of the plate.

31. The printhead according to Claim 30, the at least one nozzle orifice of the plate having an edge, the heat conducting ring having an inner edge, wherein the inner edge of the heat conducting element is no more than 2 microns from the edge of the at least one nozzle orifice of the plate.

32. The printhead according to Claim 26, further comprising a heat conducting element positioned on the plate, the heat conducting element being operatively associated with the heater.

33. The printhead according to Claim 26, wherein the heater includes a plurality of individually actuatable sections.

34. The printhead according to Claim 33, further comprising a heat conducting element positioned between the body and the plate, the heat conducting element including individually actuatable sections operatively associated with individually actuatable sections of the heater.

35. The printhead according to Claim 1, wherein the drop forming mechanism includes at least one electrical contact.

36. The printhead according to Claim 35, wherein the at least one electrical contact is positioned on a surface of the body facing the plate.

37. The printhead according to Claim 36, further comprising a heater positioned between the body and the plate, the heater being electrically connected to the at least one electrical contact.

38. A method of printing comprising:
ejecting fluid drops through a body nozzle orifice and then through a plate nozzle orifice of a plate, the plate nozzle orifice being in fluid communication with the body nozzle orifice;
removing the plate;
replacing the plate with a second plate having a nozzle orifice; and
ejecting fluid drops through the body nozzle orifice and then through the second plate nozzle orifice, the second plate nozzle orifice being in fluid communication with the body nozzle orifice.

39. The method according to Claim 38, wherein the second plate includes a nozzle orifice that is distinct from the plate.

40. The method according to Claim 38, further comprising:
performing a cleaning function on at least one of the body and the plate after the plate has been removed.

41. A method of printing comprising:
ejecting fluid drops through a body nozzle orifice and then through a plate nozzle orifice of a plate, the plate nozzle orifice being in fluid communication with the body nozzle orifice;
manipulating the plate;
repositioning the plate; and
ejecting fluid drops through the body nozzle orifice and then through the plate nozzle orifice, the plate nozzle orifice being in fluid communication with the body nozzle orifice.

42. The method according to Claim 41, wherein manipulating the plate cleans the plate.

43. The method according to Claim 41, wherein manipulating the plate cleans the body nozzle orifice.

44. The method according to Claim 41, wherein manipulating the plate includes indexing the plate.

45. A printhead comprising:
a body, portions of the body defining an fluid chamber;
a drop forming mechanism operatively associated with the fluid chamber; and

a removable plate having a first position over the body and a second position removed from the body, the plate having at least one orifice, the at least one plate orifice being in fluid communication with the fluid chamber of the body when the plate is located in the first position over the body.

46. The printhead according to Claim 45, portions of the body defining a nozzle orifice, the nozzle orifice being in fluid communication with the fluid chamber, wherein the nozzle orifice is located between the fluid chamber and the removable plate when the removable plate is in the first position over the body.

47. The printhead according to Claim 46, wherein the printhead is operable to produce a fluid drop when the removable plate is located in the second position removed from the body.

48. The printhead according to Claim 47, wherein the fluid drop has a first volume, wherein the printhead is operable to produce a fluid drop having a second volume when the removable plate is located in the first position over the body.

49. The printhead according to Claim 45, wherein the printhead is operable to produce a fluid drop when the removable plate is located in the first position over the body.

50. The printhead according to Claim 49, wherein the fluid drop is a liquid drop.

51. The printhead according to Claim 45, wherein the printhead is a drop on demand type printhead.

52. The printhead according to Claim 45, wherein the printhead is a continuous type printhead.

53. The printhead according to Claim 45, the body including an array of fluid chambers, the removable plate including an array of the at least one plate orifices, wherein individual orifices of the array of the at least one orifices vary in size.

54. The printhead according to Claim 45, the body including an array of fluid chambers, the removable plate including a two dimensional array of the at least one plate orifices.

55. The printhead according to Claim 54, wherein orifices of the two dimensional array are positioned on the plate such that redundant pairs of orifices are formed.

56. The printhead according to Claim 45, wherein a ratio of fluid chambers to at least one plate orifices is 1 to 1.

57. The printhead according to Claim 45, wherein a ratio of fluid chambers to at least one plate orifices is something other than 1 to 1.